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THE LARVA OF *PACHYDRUS PRINCEPS*
(COLEOPTERA: DYTISCIDAE)¹

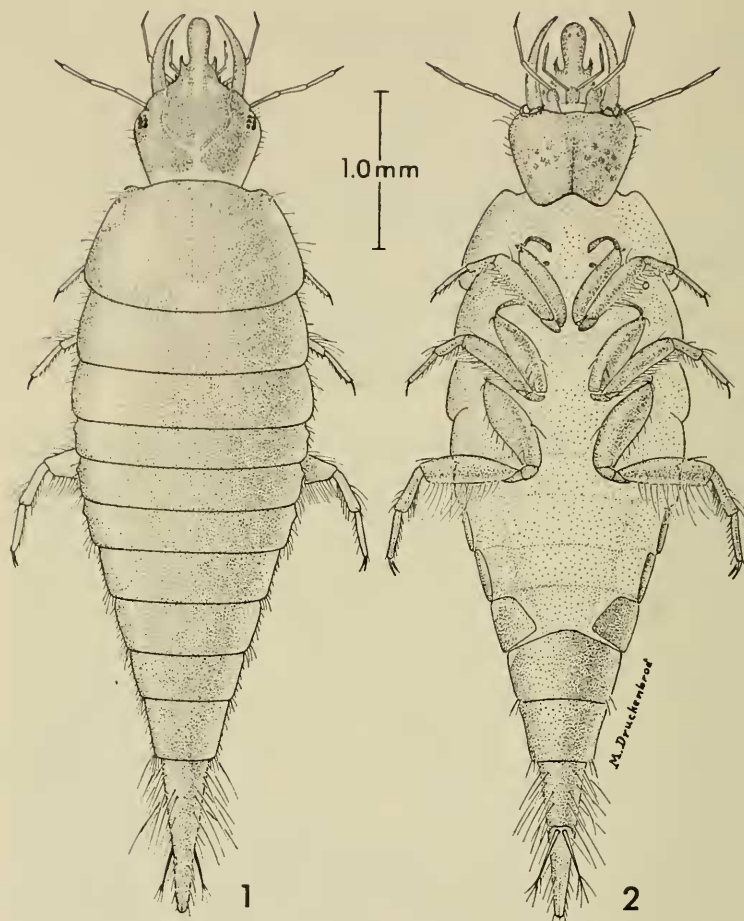
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The genus *Pachydrus* with nine described species is known only from the tropical regions of the Western Hemisphere. A single species, *Pachydrus princeps* (Blatchley), occurs in the United States in subtropical Florida and southern Georgia.

Larvae of *Pachydrus* were recognized for some years (Spangler, 1963) because they were frequently collected in association with adults in the Neotropics. However, they were not described because more than one species occurred together and it was impossible to ascertain the correct species name without rearing the larvae to the adult stage. Bertrand (1968) described a larva of *Pachydrus* sp. and illustrated the nasale and last abdominal segments in his treatment of the aquatic coleoptera larvae collected in Brazil by M. G. Marlier.

By elimination of known larvae of hydroporine genera and because *P. princeps* is the only species of that genus to occur in Florida the larva may be identified confidently to species by association. Therefore, a search was made in Florida by Folkerts and the typical hydroporine larvae were collected in association with adults of *P. princeps* at 11.6 miles southeast of Trenton, Gilchrist County, Florida, on 3 Sept. 1969. The Floridian larva described below agrees generically with the presumed *Pachydrus* larvae from the Neotropics.

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FIGS. 1-2. *Pachydus princeps* (Blatchley), larva: 1, habitus, dorsal view; 2, habitus, ventral view.

DESCRIPTION OF THE THIRD-INSTAR LARVA

Length, 6.1 mm; greatest width of pronotum, 1.4 mm. Body fusiform (Figs. 1, 2); dorsum convex, venter flat. Color infusate dorsally except nasale, area of antennal insertion, ocular area around black ocelli, base of head, 6 maculae on pronotum, anterolateral angles of each thoracic nota and 4th through 6th abdominal terga creamy yellow. Dorsum of 7th abdominal segment testaceous at base. Dorsum of 8th abdominal segment infusate at basal third and becoming testaceous

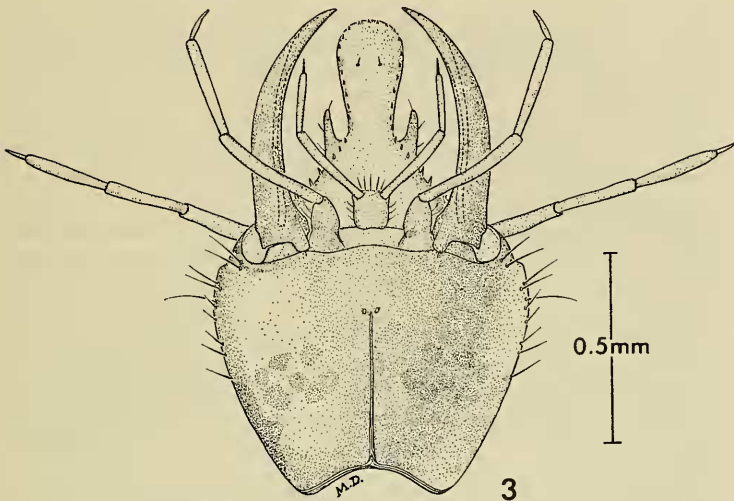


FIG. 3. *Pachydrus princeps* (Blatchley), larval head capsule, ventral view.

to apex. Basal antennal segment testaceous; 2nd and 3rd antennal segments infusate basally, lighter apically; 4th antennal segment infusate. Ventral surface of head capsule (Fig. 3) creamy yellow to testaceous, with poorly defined transverse band of infusate maculae across middle of head and a longitudinal stripe on midline. Mandibles testaceous; maxillae and labium lightly infusate to creamy yellow. Venter of thoracic and abdominal segments 1 through 5 greyish white. Coxae, trochanters, and femora greyish white; tibiae, tarsi, and tarsal claws testaceous.

Head subquadrate, narrower posteriorly, with distinct spatulate nasale. Nasale with a short but distinct branch on each side at base; anteroventral margin with numerous setae and 8 to 10 long hairs; lateroventral margin with 6 to 8 stout setae and 1 long hair between basal branch and anterolateral corner of nasale, and 8 stouter setae between basal branch and mandibular articulation; ventral surface with 1 stout seta on each side of midline at apical third. Each basal branch of nasale bears 3 stout setae; 1 basolateral, 1 mediolateral, and 1 apicoventral. Ecdysial cleavage line united at base and forked at basal fourth of head; frontal arms curve laterally and sinuously and terminate between base of nasale and antenna. Dorsal surface of head with alutaceous sculpture behind base of nasale; with 3 to 5 stout temporal setae behind each ocular area, 17 to 20 long slender setae below and behind each ocular area, 7 or 8 setae bordering each frontal arm of ecdysial cleavage line, and 5 or 6 setae near midline at base of nasale. Ventral surface of head

(Fig. 3) feebly alutaceous basally; 2 tentorial pits behind base of labium; concave anteriorly along midline. Ocular area with 6 ocelli; upper 4 arranged as in a square, lower 2 diagonally oriented to bottom of square.

Antenna 4 segmented; basal segment longest; 2nd and 3rd segments subequal; apical segment shortest, about $\frac{1}{3}$ as long as 3rd segment, with an elongate appendage beside it arising from apex of penultimate segment; segments glabrous.

Mandible long, slender, falciform, curved upward and inward apically, grooved along inner surface, with a small basolateral seta. Maxillary stipes rudimentary. Maxillary palpus slender, elongate, 4 segmented; 1st segment (palpifer) slightly longer than last segment; 2nd and 3rd segments subequal; basal segment bearing 2 lateral setae; 2nd, 3rd, and 4th segments glabrous. Labium small, subrectangular, dorsal surface with 4 short slender medial setae and 4 long slender setae on each side and behind medial pair; ligula absent. Labial palpus very slender, 3 segmented; 2nd segment with a short slender apicolateral seta.

Pronotum broad basally, narrowed anteriorly; lateral and posterior margins arcuate; anterior margin bisinuate; with many short setae scattered irregularly over surface and numerous long slender setae along lateral margins. Mesonotum slightly wider than and about half as long as pronotum, with numerous short setae scattered irregularly over surface and a few long slender setae along lateral margins; a spiracular opening present in pleural region below anterolateral angle of mesonotal sclerite. Metanotum slightly wider than and about as long as mesonotum; setation similar to that of mesonotum.

Legs moderately long, 5 segmented; coxa long; trochanter about $\frac{1}{3}$ as long as coxa; femur about as long as tibia and tarsus combined; tarsus with 2 elongate, slender claws, inner (lower) claw longer than outer claw. Procoxa with 2 long setae along lower medial margin and 6 or 7 long setae on lower lateral margin. Meso- and metacoxa each with 1 long seta on upper surface; 3 long setae on lower apicomедial margin and 6 or 7 long setae on lower lateral margin. Trochanters each with 1 short slender seta at apicoventral angle (abraded on some specimens). Femora each with 1 or 2 long apicodorsal setae and numerous setae scattered along ventral surface. Protibia with 2 long apicodorsal setae and 5 or 6 stout setae scattered along ventral surface. Mesotibia and metatibia with 2 or 3 very long and 1 shorter setae apicodorsally and 16 to 18 stout setae on ventral surface. Protarsus with 1 apicodorsal seta and 12 to 14 setae on ventral surface. Mesotarsus and metatarsus with 1 apicodorsal seta and 16 to 18 setae on ventral surface.

Abdomen of 8 distinct segments; terga of segments 1 through 5 completely sclerotized; sterna of segments 1 through 5 membranous; sternal membrane setose between procoxae and on abdominal segments 1 through 5; segments 6 through 8 completely sclerotized, ringlike.

Abdominal terga all with numerous short setae scattered irregularly over surface. Segment 8 elongate, tapering to apex, about twice length of 7th segment; lateral tracheal trunks visible through integument and terminating at apex; ventrally 2 short cerci arise at midlength. Cerci about $\frac{1}{4}$ length of 8th segment, unsegmented; each cercus with 8 setae, 4 along sides and 4 on apex. Lateral margins of abdominal segments 1 through 4 each with a spiracle.

The larva of *Pachydrus* runs to couplet 2 in Chandler's (1956) key to the larvae of the known nearctic genera of Dytiscidae. By modifying Chandler's couplet 2, *Pachydrus* may be recognized from the other hydrophilines as follows.

2. Frontal projection of nasale with a notch or short lateral branches on each side 2A.
 Frontal projection of nasale without notches (Chandler's couplet number) 4
- 2A. Frontal projection of nasale with a short lateral branch near base (Fig. 3) on each side *Pachydrus* Sharp
 Frontal projection of nasale only notched on each side (Chandler's couplet number) 3

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LITERATURE CITED

- BERTRAND, HENRI P. I. 1968. Larves de Coleopteres aquatiques recueillies au Brésil par M. G. Marlier. Bull. Soc. Ent. France 73(1-2):8-21, 6 figs.
- CHANDLER, H. P. 1956. Key to the Known Nearctic Genera of Dytiscidae, Larvae. Pages 312-314. In Usinger, R.E., Aquatic Insects of California. Berkeley, California:University of California Press.
- SPANGLER, PAUL J. 1963. A Description of the Larva of *Macrovatellus mexicanus* Sharp (Coleoptera:Dytiscidae). Coleop. Bull. 17(4): 97-100.